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SITE SAFETY PLAN

Version 988

A. GENERAL INFORMATION

Project Title: Sauget Areas 1 & 2
-(Site G & Q) Project No.: 2T2051
 TDS-9405-006 / EIL0836SAA
 TDD/Pan No.: TDS-9405-007 / EIL0837SAA

Project Manager: Steven J. Skare Project Dir.: _____

Location(s): Sauget, St. Clair County, Illinois

Prepared by: Steven J. Skare Date Prepared: 5/24/94

Approval by: Verbal by Sally Ines Date Approved: 5/25/94

Site Safety Officer Review: Steve Skare Date Reviewed: 5/25/94

Scope/Objective of Work: Site Reconnaissance, photo documentation, soil & drum
Sampling, air monitoring

Proposed Date of Field Activities: 5/27/94

Background Info: Complete: ☐ Preliminary (No analytical data available) ☒

Documentation/Summary:

Overall Chemical Hazard:	Serious <input type="checkbox"/>	Moderate <input checked="" type="checkbox"/>
	Low <input type="checkbox"/>	Unknown <input type="checkbox"/>
Overall Physical Hazard	Serious <input type="checkbox"/>	Moderate <input checked="" type="checkbox"/>
	Low <input type="checkbox"/>	Unknown <input type="checkbox"/>

B. SITE/WASTE CHARACTERISTICS

Waste Type(s):

Liquid ☒ Solid ☒ Sludge ☒ Gas/Vapor ☐

Characteristic(s):

Flammable/Ignitable ☒ Volatile ☒ Corrosive ☐ Acutely Toxic ☐

Explosive ☐ Reactive ☐ Carcinogen ☒ Radioactive* ☐

Other: _____

Physical Hazards:

Overhead ☐ Confined* Space ☐ Below Grade ☐ Trip/Fall ☒

Puncture ☒ Burn ☐ Cut ☒ Splash ☒

Noise ☐ Heat/Cold Stress ☒ Other: Terrain & pinch points

*Requires completion of additional form and special approval from the Corporate Health/Safety group. Contact RSC or HQ.
 HS018A(04/02/91)

Site History/Description and Unusual Features (see Sampling Plan for detailed description): Former Monsanto
plant with several landfill site. TAT & U.S. EPA will investigate Areas 1 & 2, within
Sites G & Q. Site G is partially covered landfill with surface fire. Site Q is covered
landfill with leachate directly into Mississippi River.
 Locations of Chemicals/Wastes: Site G: Wastes buried in the buried landfill, contains PCBs,
herbicides. Site Q: Buried wastes in landfill, also contains PCBs and herbicides.
 Estimated Volume of Chemicals/Wastes: Unknown Volume

Site Currently in Operation

Yes: ☐

No: ☒

C. HAZARD EVALUATION

List Physical Hazards by Task (i.e., drum sampling - explosion hazard, drilling - noise hazard, etc.) and number them. (Task numbers are cross-referenced in Section D)

Task/Physical Hazard Evaluation: 1. Site Reconnaissance - slip, trip, fall; puncture cut, heat stress
2. Soil Sampling - slip, trip, fall; puncture; cut; heat stress; unstable footing
3. Drum Sampling - slip, trip, fall; puncture; cut, heat stress; explosive hazard.
4. Photodocumentation - slip, trip, fall; puncture, cut; heat stress
5. Air monitoring - slip, trip, fall; puncture, cut, heat stress; explosive hazard

Chemical Hazard Evaluation:

Compound	PEL/TWA	Route of Exposure	Acute Symptoms	Odor Threshold	Odor Description
2,4-D	10 mg/m ³	IH, E, SK, IN	CAR, DA, DS, V, N, A, LC, CON, DP	N/A	N/A
2,4,5-T	10 mg/m ³	IH, E, SK, IN	IR, CD, AT, TER, CAR	2.92 mg/Kg	ODORLESS
2,4,5-TP (Silver)	NONE SET	IH, E, SK	CAR, MUT	N/A	N/A
PCBs	10 ppm	IH, E, SK	IR, SK	N/A	N/A
Benzene PEL-10 ppm	10 ppm	IH, E, SK	IR, H, W, IRI, DS, CON, IR, DP, V, BV, SB	4.68 ppm	Sweet odor
Dioxin (2,3,7,8-TCDD)	NONE GIVEN	IH, E, SK, IN	CHL, H, LIV. TOX.	N/A	N/A
Lead	PEL 0.5 mg/m ³	IH, E, SK, IN	CAR, POIS, AM, H, AC, W, SB, V, DS	NONE	N/A
Toluene	PEL 100 mg/m ³ TLV - 50 mg/m ³	IH, E, SK, IN	CAR, TER, MUT, A, IR, IRI, W, DZ, LL, BV, V, H	0.17 ppm	Sweet
Pentachlorophenol	PEL 0.5 mg/m ³	IN, IH, E, SK	IRI, U, CP	None Listed	Pungent

Note: Complete and attach a Hazard Evaluation Sheet for major known contaminants. Codes for C.H.E. below:

AB = ABDOMINAL PAIN
 AC = ACES
 AN = ANEMIA
 BV = BLURRED VISION
 C = COUGHING
 W = WEAKNESS
 H = HEADACHES
 SB = SHORTNESS OF BREATH
 TER = TERATOGEN

DA = DERMAL ABSORPTION
 DI = DIARRHEA
 DS = DISTRESSED STOMACH
 DP = CNS DEPRESSION
 DR = DROWSINESS
 CD = CONTACT DERMATITIS
 LC = LOSS OF CONSCIOUSNESS
 OTHER: CAR - SUSPECTED CARCINOGEN
 MUT = MUTAGEN

IH = INHALATION
 IN = INGESTION
 IRI = IRR OF E/M/THROAT
 IR = IRRITATION
 E = EYES
 DZ = DIZZINESS
 RT = RESPIRATORY TRACT
 CON = CONVULSIONS
 CHL = CHLORACNE

A = OCULAR
 SK = SKIN CONTACT
 U = ULCERATION
 V = VOMITING
 M = MOUTH
 CP = CHEST PAIN
 N = NAUSEA
 AT = ATOKIA
 POIS = POISON

Site No. Savage Area 1 & 2
 Job No. _____
 TOD/PLM _____

CHEMICAL HAZARD EVALUATION (continued)

Compound	PEL/TWA	Route of Exposure	Acute Symptoms	Odor Threshold	Odor Description
Arsenic	PEL 10mg/m ³ TLV 0.2mg/m ³	IH, E, IN	DS, V, W, IR, IR N, DI, CAR	N/A	Odorless
Barium	PEL 0.5mg/m ³ TLV	IH, E, SK, IN	IR, IR, IR, DS, V DI, AC, W	N/A	N/A
Cadmium	PEL 0.2mg/m ³ TLV 0.05mg/m ³	IH, E, SK, IN	IR, IR, IR, CP, SB W, N, V, D2, SD, AT	N/A	NONE
Chromium	PEL 1.0mg/m ³ TLV N/A	IH, E, SK, IN	CD, U, Gf SK, ANNA IR, IR	N/A	N/A
Chrom, Hex	PEL 0.5mg/m ³ TLV 0.05mg/m ³	IH, E, SK, IA	IR, CAR, IR, CD, H, U, N, V	Variable	N/A
Ethyl Benzene	PEL 100 ppm TLV 100 ppm	IH, E, SK, IN	IR, IR, D2, CP N, H, V, DP	140 ppm	solvent smell
Nickel	PEL 1mg/m ³ TLV 1mg/m ³	IH, E, SK, IN	IR, IR, N, V, H CD, CAR	NONE	NONE
Xylene	PEL 100 ppm TLV 100 ppm	IH, E, SK, IN	D2, H, C, N, V AB, IR	20 ppm	sweet, aromatic
Zinc	PEL 10mg/m ³ TLV 10mg/m ³	IH, E, SK, IN	IR, C, W, AC N, V	N/A	N/A

Site Name Sauget Arms 1 & 2
Job No. _____
TDD/PAN _____

SITE HISTORY (Continued)

The site has been investigated extensively by IEPA, with a ESI completed for the site in 1988. State lent project until recently, when the fire occurred sometime within last 3 months. U.S. EPA will conduct site assessment to determine threats to public health and the environment. Site Q experienced flooding which eroded part of landfill cover exposing drums. State information indicates at least one drum to contain approx. 5% PCB.

E. EMERGENCY INFORMATION

(Use supplemental sheets, if necessary)

LOCAL RESOURCES

(Obtain a local telephone book from your hotel, if possible)

Ambulance 911 - E. St. Louis
 Hospital Emergency Room St. Marys Hospital 129 N. 8th St. (618) 274-1900
 Poison Control Center (800) 852-2022
 Police (include local, county sheriff, state) 911 - E. St. Louis
 Fire Department 911 - E. St. Louis
 Airport N/A
 Agency Contact (EPA, State, Local USCG, etc.) U.S. EPA Sam Borries (312) 353-2886
 Local Laboratory N/A
 UPS/Fed. Express (800) 288-5355
 Client/EPA Contact U.S. EPA Sam Borries / OK
 Site Contact Same

SITE RESOURCES

Site Emergency Evacuation Alarm Method 3 horn blasts on vehicle or verbal
 Water Supply Source Bottled water
 Telephone Location, Number Mobile Phone
 Cellular Phone, if available Same as above
 Radio 2-way radios (3)
 Other N/A

EMERGENCY CONTACTS

1. Dr. Raymond Harbison (Univ. of Florida) (501) 221-0465 or (904) 462-3277, 3281
 Alachua, Florida (501) 370-8263 (24 hours)
2. Ecology and Environment, Inc., Safety Director
 Paul Jonmaire (716) 684-8060 (office)
 (716) 655-1260 (home)
3. Dean Tiebout, Regional Safety Coordinator, Chicago (312) 663-9415 (office)
 (312) 338-4423 (home)
4. Jerry Oskvarek, Office Manager, Chicago (312) 775-7040 (home)
5. Tom Kouris, TAT Leader, Chicago (312) 201-3790 (office)
 (219) 924-1341 (home)
6. Pat Zwilling, ATATL, Chicago (708) 587-5934 (home)
7. Ron Bugg, TAT Safety Officer, Chicago (219) 922-8836 (home)

2. SITE BACKGROUND

2.1 SITE DESCRIPTION

The DCP area is located in and around the cities of Sauget (formerly Monsanto) and Cahokia in west-central St. Clair County, Illinois (see Figure 2-1). The project area consists of 12 suspected uncontrolled hazardous waste sites, and six segments of Dead Creek, which is an intermittent stream flowing southerly in the eastern portion of the project area. To avoid confusion stemming from various file designations or aliases for the various sites or creek sectors, each site or creek sector has been assigned an alphabetical designation (see Figure 2-2). The disposal sites occupy approximately 220 acres.

The scope of work revision submitted to IEPA in August 1986 included the concept of grouping several sites and creek sectors together for future Hazard Ranking System (HRS) scoring purposes. Sites were grouped into areas based on geographical relationship, same ownership or similar operation, and similar waste types and common exposure pathways. Sites grouped into areas included Sites G, H, I, L, and Creek Sectors A and B (Area 1), and Sites O, Q, and R (Area 2). These areas are presented in Figure 2-3. Sites J, K, M, N, and P do not meet requirements for site aggregation and will be referred to henceforth as peripheral sites.

The DCP sites consist of a number of former municipal and industrial waste landfills; surface impoundments or lagoons; surface disposal areas; past excavations thought to be filled or partially filled with unknown wastes; and an areal drainage flowpath (Dead Creek).

Personnel Decon Protocol: Dry decon - whenever possible; water boot wash when necessary
with distilled water rinse after Alconox solution wash.

Decon Solution Monitoring Procedures, if Applicable: Alconox detergent wash; will be changed
out based on discoloration.

Special Site Equipment, Facilities, or Procedures (Sanitary Facilities and Lighting
Must Meet 29 CFR 1910.120): All work to be during daylight hours.

Site Entry Procedures and Special Considerations: Permission will be obtained prior to site entry. Stay upwind
of contamination when possible. The buddy system will be maintained at all times.

Work Limitations (time of day, weather conditions, etc.) and Heat/Cold Stress Requirements:

Work is restricted to daylight hours only and workers are to be monitored for heat/cold stress. When
vermiculite is used to pack samples, dust masks will be worn.

General Spill Control, if applicable: None anticipated

Investigation-Derived Material Disposal (i.e., expendables, decon waste, cuttings):

Investigative-derived materials will be decontaminated in accordance with procedures listed above. The
decontaminated material will be bagged and left on-site in appropriate waste containers with prior permission of
site owner/operator

Sample Handling Procedures Including Protective Wear:

After samples have been collected, the outside of the sample bottles will be decontaminated by washing (not
submerging) the bottles in an Alconox solution and rinsing in distilled water. The protective clothing level
(i.e. suits, gloves, boots) worn during on-site job activities will be maintained while decontaminating the
bottles. Respiratory protection will be worn based on professional judgement. Latex gloves, at a minimum,
will be worn while handling the bottles after decontamination.

Team Member*

Steve Skore / Sam Borries U-SETA
Steve Skore

Responsibility

Team Leader

Site Safety Officer

*All entries into exclusion zone require Buddy System use. All E & E field staff participate in medical
monitoring program and have completed applicable training per 29 CFR 1910.120. Respiratory protection program
meets requirements of 29 CFR 1910.134, and ANSI Z88.2 (1980).

D. SITE SAFETY WORK PLAN

Site Control: Attach map, use back of this page, or sketch of site showing hot zone, contamination reduction zone, etc.

Perimeter identified? (☒) ☒ Site secured? (☒) ☒
 Work Areas Designated? (☒) ☒ Zone(s) of Contamination Identified? (☒) ☒

Personnel Protection (TLD badges required for all field personnel):

Anticipated Level of Protection (Cross-reference task numbers to Section C):

	A	B	C	D
Task 1			X	
Task 2			X	
Task 3		X		
Task 4			X	

(Expand if necessary)

X

Modifications:

*Task 5
Downgrade depending on air monitoring results*

Action Levels for Evacuation of Work Zone Pending Reassessment of Conditions:

- Level D: O_2 <19.5% or >25%, explosive atmosphere >10% LEL, organic vapors above background levels, particulates >0.025 mg/m³, other _____.
- Level C: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapor (in breathing zone) >5 ppm, particulates >0.05 mg/m³, other _____.
- Level B: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors (in breathing zone) >500 ppm, particulates >N/A mg/m³, other _____.
- Level A: O_2 <19.5% or >25%, explosive atmosphere >25% LEL (California-20%), unknown organic vapors >500 ppm, particulates >N/A mg/m³, other _____.

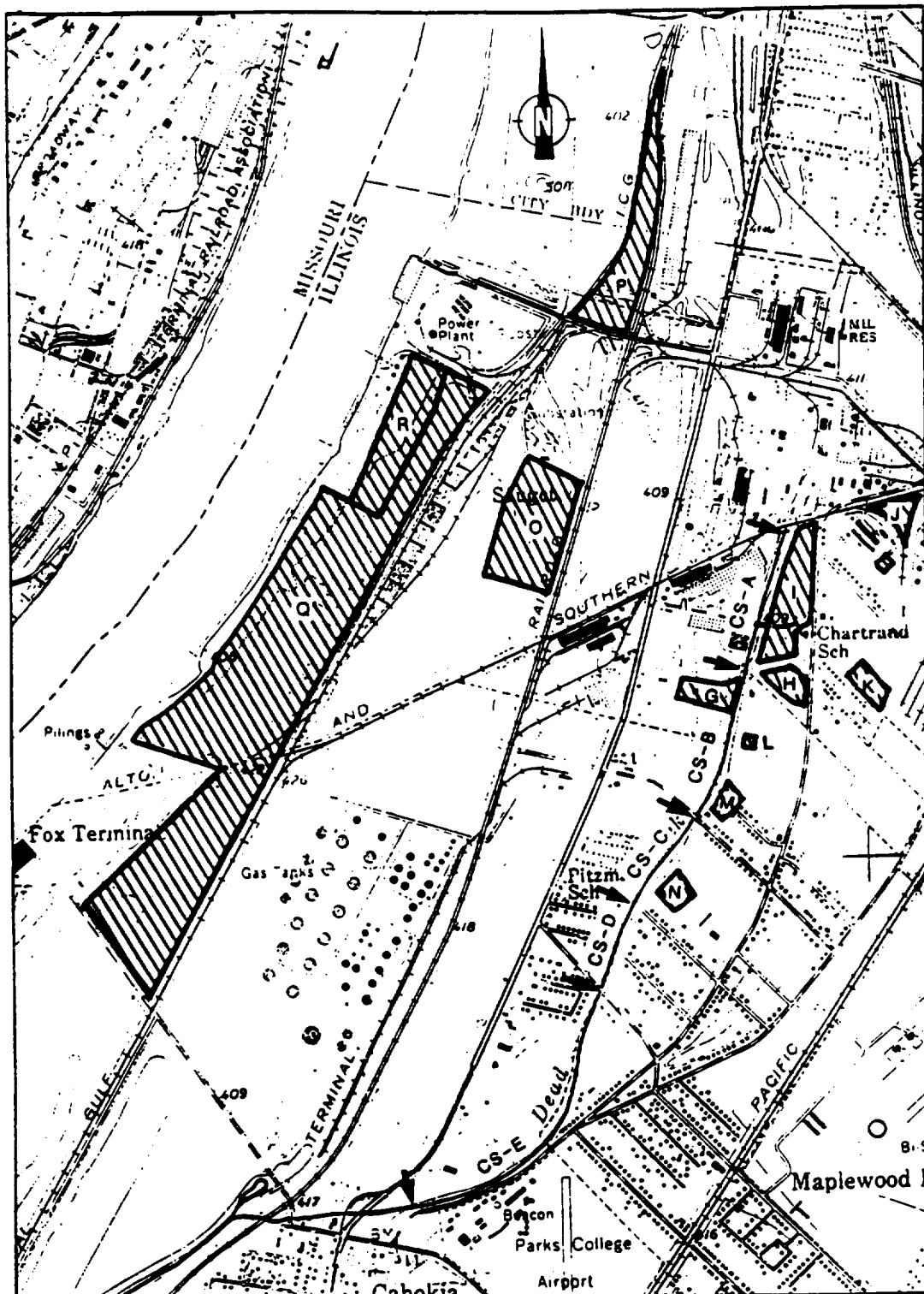
Air Monitoring (daily calibration unless otherwise noted):

Contaminant of Interest	Type of Sample (area, personal)	Monitoring Equipment	Frequency of Sampling
Explosive gases	Area	Explosimeter	Continuous
Organic vapors	Area	HNU	Continuous
Radiation	Personal	TLD	Continuous

(Expand if necessary)

Decontamination Solutions and Procedures for Equipment, Sampling Gear, etc.:

- ① Wash equipment/sampling tools with Alconox detergent solution.
- ② Distilled water rinse.
- ③ Air dry.
- ④ NOTE: Gross removal of contamination prior to step ① if necessary.



SOURCE: USGS Cahokia Quad, 1974.

SCALE

0 0.5 1 MILE

FIGURE 2-2 SITE REPORTING DESIGNATIONS FOR THE DEAD CREEK PROJECT

MEDTOX HOTLINE

1. Twenty-four hour answering service: (501) 370-8263

What to report:

- State: "this is an emergency."
 - Your name, region, and site.
 - Telephone number to reach you.
 - Your location.
 - Name of person injured or exposed.
 - Nature of emergency.
 - Action taken.
2. A toxicologist, (Drs. Raymond Harbison or associate) will contact you. Repeat the information given to the answering service.
3. If a toxicologist does not return your call within 15 minutes, call the following persons in order until contact is made:
- a. 24 hour hotline - (716) 684-8940
 - b. Corporate Safety Director - Paul Jonmaire - home # (716) 655-1260
 - c. Assistant Corp. Safety Officer - Steven Sherman - home # (716) 688-0084
 - d. Chicago Health & Safety Manager - Dean Tiebout - home # (312) 338-4423

EMERGENCY ROUTES

(NOTE: Field Team must Know Route(s) Prior to Start of Work)

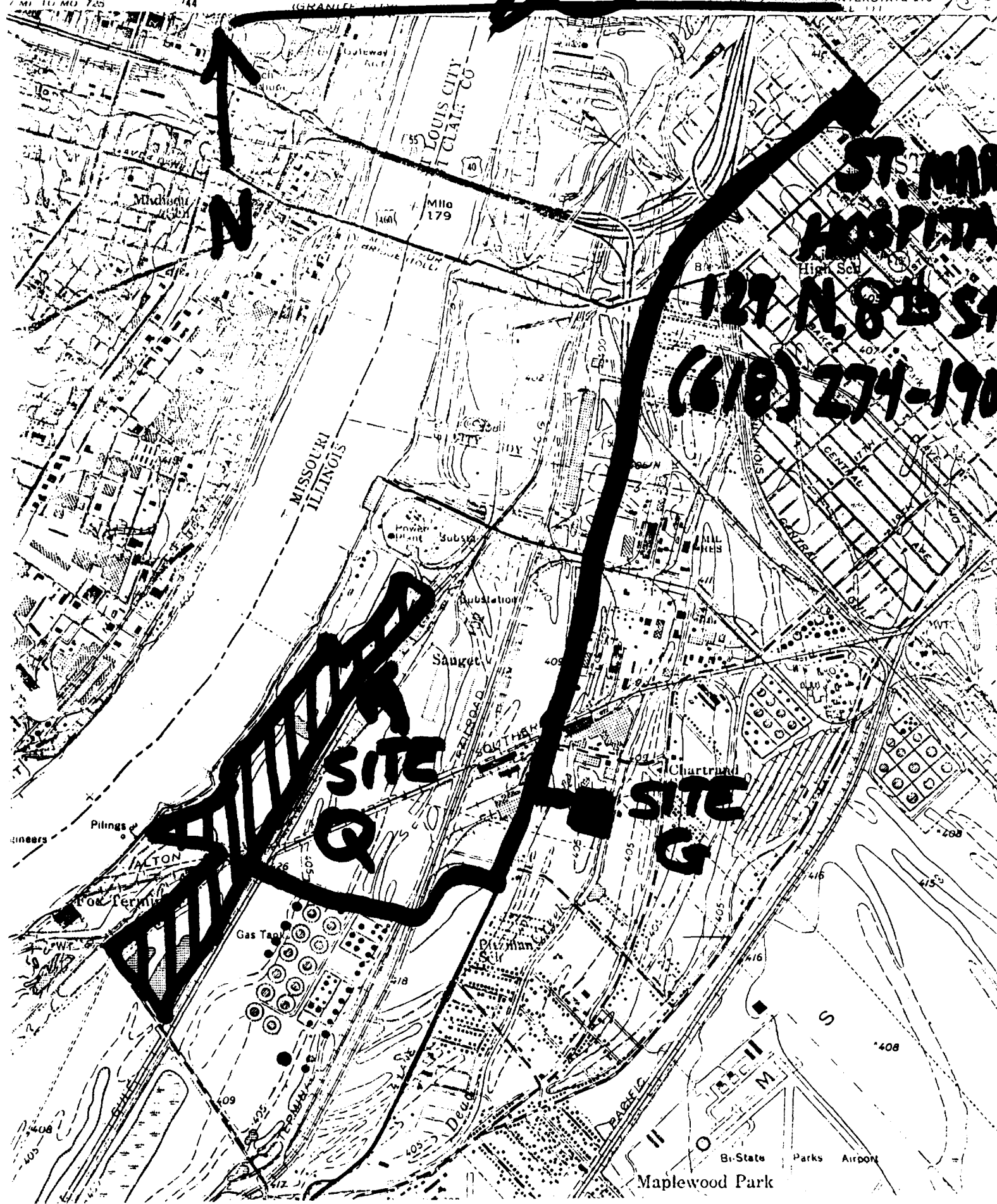
Directions to hospital (include map)

Follow service road to Hwy 50. Go north on Hwy 50 for 3-4 miles. Hwy 30 turns into 8th St in downtown E-St. Louis. Follow 8th St. up to Hwy 15 (Missouri Ave) intersection. St. Marys Hospital 129 N. 8th St E. St. Louis Mo

Emergency Egress Routes to Get Off-Site

Follow service roads to Hwy 50. Regroup at this point.

2 G.



INSTRUMENTATION	No.	DECON EQUIPMENT	No.
OVA		WASH TUBS	
THERMAL DESORBER		BUCKETS 2	✓
O2/EXPLOSIMETER W/CAL. KIT 1	✓	SCRUB BRUSHES 2	✓
PHOTOVAC TIP		PRESSURIZED SPRAYER	
MMu (Probe 10.2 OR 11.7) 1	✓	DETERGENT (Type Alconex)	✓
MAGNETOMETER		SOLVENT (Type)	
PIPE LOCATOR		PLASTIC SHEETING	
WEATHER STATION		TARPS AND POLES	
DRAEGER PUMP, TUBES		TRASH BAGS 3	✓
BRUNTON COMPASS		TRASH CANS	
MONITOX CYANIDE		MASKING TAPE	
HEAT STRESS MONITOR		DUCT TAPE 2 rolls	✓
NOISE EQUIPMENT		PAPER TOWELS 2 rolls	✓
PERSONAL SAMPLING PUMPS (Type)		FACE MASK SANITIZER 2 packs	✓
DUST MONITOR (MDA OR GCA System)		FOLDING CHAIRS 2	✓
		STEP LADDERS	
RADIATION EQUIPMENT		DISTILLED WATER 2 bottles	✓
TLD BADGES 1	✓		
DOCUMENTATION FORMS			
PORTABLE RATEMETER			
SCALER/RATEMETER		SAMPLING EQUIPMENT	
NaI Probe		80 OZ. AMBER GLASS BOTTLES	
LaS Probe		1 L. AMBER GLASS BOTTLES 12	✓
GM Pancake Probe		40 ML. VIALS	
GM Side Window Probe		1 L. PLASTIC	
MICRO R METER / RAD-MINI		8 OZ. GLASS 2 doz.	✓
ION CHAMBER		120 ML. GLASS	
ALERT DOSIMETER		SPOONS 6	✓
POCKET DOSIMETER		KNIVES	
		FILTER PAPER	
FIRST AID EQUIPMENT		PERSONAL SAMPLING PUMP SUPPLIES	
FIRST AID KIT	✓	SUCK CALIBRATOR	
OXYGEN ADMINISTRATOR		HAND BAILERS	
STRETCHER		THIEVING RODS WITH BULBS 24	✓
PORTABLE EYE WASH		DIOXIN SAMPLE KIT	
BLOOD PRESSURE MONITOR		PRESERVATIVES: HNO3 NaOH other	
FIRE EXTINGUISHER	✓	STRING	

VAN EQUIPMENT	No.	MISCELLANEOUS (Cont.)	No.
TOOL KIT	✓	HEARING PROTECTION	
HYDRAULIC JACK		LIFE VESTS	
LUG WRENCH		WALKIE-TALKIE	
TOW CHAIN		CONDUCTIVITY METER	
VAN CHECK OUT		PH METER	
Gas		CAMERA	✓
Oil		WATER-LEVEL INDICATOR	
Antifreeze		SPLIT SPOON SAMPLERS	
Battery		PVC HAND PUMP	
Windshield Wash		RESISTIVITY METER	
Tire Pressure	0	WELL POINT SAMPLER	
		ROB AIR PUMP SYSTEM	
MISCELLANEOUS		THERMOMETER	
CHALK		MASTERFLEX PUMP & FILTER APPARATUS	
LEVEL/TRIPOD AND ROD		SHIPPING EQUIPMENT	
BOWLS		COOLERS	2 ✓
PITCHER PUMP		PAINT CANS WITH LIDS, 7 CLIPS EACH	16 ✓
SURVEYOR'S TAPE		VERMICULITE	1 bag ✓
100 FIBERGLASS TAPE		DUST MASK	
300 NYLON ROPE		SHIPPING LABELS	✓
NYLON STRING		DOT LABELS: "DANGER"	✓
SURVEYING FLAGS		"UP"	✓
FILM + Camera	1 ✓	"INSIDE CONTAINER COMPLIES ..."	✓
WHEEL BARROW		"HAZARD GROUP"	✓
BUNG WRENCH	1 ✓	STRAPPING TAPE	
SOIL AUGER		BOTTLE LABELS	✓
PICK		BAGGIES	
SHOVEL	1 ✓	CUSTODY SEALS	✓
CATALYTIC HEATER		CHAIN-OF-CUSTODY FORMS	✓
PROPANE GAS		FEDERAL EXPRESS FORMS	✓
BANNER TAPE		CLEAR PACKING TAPE	✓
SURVEYING METER STICK			
CHAINING PINS & RING			
TABLES			
WEATHER RADIO			
BINOCULARS			
MEGAPHONE			

SITE SAFETY MEETING
(Must be filled out by Site Safety Officer at the site)

Project Savage Area 1 & 2 TDD: 705-9405-006 PAN #: 705-9405-007
Site Safety Officer: Steve Skare Date 5/27/94 Time _____
Address: _____
Type of Work: Air monitoring, site reconnaissance, soil & drum sampling

SAFETY TOPICS PRESENTED

Protective Clothing/Equipment: Level B: Saranex coveralls, SCBA, Nitrile gloves, rubber steel toe boots
Level C: Tyvek coverall, APR, GMCH cartridge, Nitrile outer gloves, latex inner gloves, steel toe boots
Chemical Hazards: PCBs, pentachlorophenol, 2-4-D, herbicides, heavy metals
Physical Hazards: trip, fall hazards, puncture, cut, splash, heat stress, terrain, and pinch point
Radiation Hazards: none anticipated
Emergency Procedures: 3 horns blasts or verbal. Meet at site entrance with head count.
Rash injured to hospital, if needed.

Hospital/Clinic: St. Mary's Hospital Telephone: (618) 274-1900
Hospital Address: 129 N. 8th St. Emergency Telephone #: Same
Special Equipment: fire extinguisher & first aid kit
Others: none

Checklist

1. Emergency information reviewed? (Y) / N and made familiar to all team members? (Y) / N
2. Route to nearest hospital explained and reviewed? (Y) / N and its location known to all team members? (Y) / N
3. Site safety plan readily available and its location known to all team members? (Y) / N

The site safety meeting shall be attended by all personnel who will be working within the site area. Daily informational update meetings will be held when site tasks and conditions change.

ATTENDANCE

PRINT NAME	SIGNATURE	DATE
<u>Steve Skare</u>	<u>[Signature]</u>	<u>5/27/94</u>
<u>Sam Boerries</u>	<u>[Signature]</u>	<u>5/27/94</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

MEETING CONDUCTED BY: _____

ECOLOGY AND ENVIRONMENT, INC. - CHICAGO

Site Name: _____ PAN/TDD#: _____
 Date: _____ Wind Direction: _____ Weather: _____

EQUIPMENT	ID#	CALIB./OPER. CHECK	INITIALS & DATE	BACKGROUND READING	ON-SITE READING
OVA					
HNu					
Photovac Tube					
O2 Meter					
Exposimeter					
Combo-meter					
Rad-MINI					
Monitor-4					
Draeger tubes					
Monitox					
OTHERS:					

Attendees at Site: _____

Protective Clothing Worn: _____

Comments on Monitoring or Protective Clothing (ex: Was the monitoring equipment possibly effected by the weather?) _____

Team Leader _____
 (Print Name) (Signature) (Date)

Site Safety Officer _____
 (Print Name) (Signature) (Date)

Please submit the original to Ron Bugg and a copy to the project file

SITE DISINTEGRATION LOG

PROJECT/PAN # _____

SITE NAME _____

SITE SAFETY OFFICER _____

WEEK OF _____

**NAME AND
DOSIM. #**

MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY SUNDAY

[illegible]

To the nearest half-hour, record time spent downrange as "S" (e.g., S:2.5hrs), time spent in active FDS operation as "P", and any time spent downrange in rescue activity as "R".

THE SIGMA-ALDRICH LIBRARY OF CHEMICAL SAFETY DATA

Explanation of Codes

PROCEDURES FOR SPILLS OR LEAKS

- 1 Absorb on sand or vermiculite and place in closed container for disposal.
- 2 Cover with dry lime, sand, or soda ash. Place in covered containers using nonsparking tools and transport outdoors.
- 3 Shut off all sources of ignition.
- 4 Evacuate area.
- 5 Cover with an activated carbon adsorbent, take up and place in closed container. Transport outdoors.
- 6 Ventilate area and wash spill site after material pickup is complete.
- 7 Sweep up, place in a bag and hold for waste disposal.
- 8 Avoid raising dust.
- 9 Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves.
- 10 Wear respirator, chemical safety goggles, rubber boots and heavy rubber gloves.
- 11 Cover with dry lime or soda ash, pick up, keep in a closed container and hold for waste disposal.
- 12 Carefully sweep up and remove.
- 13 Flush spill area with copious amounts of water.
- 14 Mix with solid sodium bicarbonate.
- 15 Place in appropriate container.
- 16 Wear protective equipment.
- 17 Wash spill site with soap solution.
- 18 Please contact the Technical Services Department. Be sure to mention the name and catalog number of the material.

FIRE-EXTINGUISHING MEDIA

- 1 Carbon dioxide.
- 2 Dry chemical powder.
- 3 Water spray.
- 4 Alcohol or polymer foam.
- 5 Class D fire-extinguishing material only.
- 6 Water may be effective for cooling, but may not effect extinguishment.
- 7 Carbon dioxide, dry chemical powder, alcohol or polymer foam.
- 8 Foam and water spray are effective but may cause frothing.
- 9 Do not use dry chemical powder extinguisher on this material.
- 10 Do not use carbon dioxide extinguisher on this material.
- 11 Noncombustible.
- 12 Do not use water.
- 13 Use extinguishing media appropriate to surrounding fire condition.



WASTE-DISPOSAL METHODS

The disposal methods outlined below are intended only as guides. We do not assume responsibility for their use. Careful consideration must be given to the chemical and physical properties of the substance. In addition, local laws and regulations may preclude the use of these methods which are primarily designed for small quantities. Observe all federal, state, and local laws.

The disposal of some chemicals may require deactivation or modification of the material by chemical means. Chemical waste-disposal reactions must be handled with the same care and consideration used with synthetic procedures. Appropriate consideration must be given to reaction conditions, i.e., stoichiometry, order and rate of addition, heat of reaction, evolution of gaseous products, pH, efficiency of stirring, rate of reaction, atmospheric sensitivity, etc.

Chemical waste-disposal reactions should be carried out in a chemical fume hood and in appropriate laboratory glassware. Because these reactions are often vigorous, protective safety equipment such as safety goggles, respirator, gloves, face and/or safety shield and other protective equipment must be used.

Initial reactions in a disposal sequence should be carried out on a small scale (5-10g). The reactant concentrations should not exceed 10% of the reaction volume and the final reaction volume should not exceed 50% of the working capacity of the reaction vessel, regardless of the reaction scale. Larger quantities of the material should be handled in several small-size reactions. To ensure completion of reaction, the waste disposal procedure should be run for at least an additional 4 to 8 hours after all materials have been mixed.

All reactions should be run by technically qualified persons familiar with the potential hazards of the chemical reactions.

- A Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
- B The material should be ignited in the presence of sodium carbonate and slaked lime (calcium hydroxide). The substance should be mixed with vermiculite and then with the dry caustics, wrapped in paper and burned in a chemical incinerator equipped with an afterburner and scrubber.
- C This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber.
- D Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable.
- E To a solution of the product in water, add an excess of dilute sulfuric acid. Let stand overnight. Remove any insolubles and bury in a landfill site approved for hazardous-waste disposal.
- F Cautiously dissolve the material in water. Neutralize immediately with sodium carbonate or, if the material does not dissolve completely, add a little hydrochloric acid followed by sodium carbonate. Add calcium chloride in excess of the amount needed to precipitate the fluoride and/or carbonate.

Separate the insolubles and bury in a landfill site approved for hazardous-waste disposal.

- G Under an inert atmosphere, cautiously add the material to dry butanol in an appropriate solvent. The chemical reaction may be vigorous and/or exothermic. Provisions must be made for venting of large volumes of highly flammable hydrogen and/or hydrocarbon gases. Neutralize the solution with aqueous acid. Filter off any solid residues for disposal as hazardous waste. Burn the liquid portion in a chemical incinerator equipped with an afterburner and scrubber.
- H Neutralize the solution and add filtering agent (10g per 100ml). Evaporate the liquid and bag the residual solid for burial in a landfill site approved for hazardous-waste disposal.
- I Dissolve the solid in (or dilute the solution with) a large volume of water. Carefully add a dilute solution of acetic acid or acetone to the mixture in a well ventilated area. Provisions should be made to vent safely the hydrogen gas given off during the decomposition. Check acidity of the solution and adjust to pH 1 if necessary. Let stand overnight. Neutralize the solution (pH 7). Evaporate the solution and bury the residue in a landfill site approved for hazardous-waste disposal.
- J Cautiously acidify a 3% solution or a suspension of the material to pH 2 with sulfuric acid. Gradually add a 50% excess of aqueous sodium bisulfite with stirring at room temperature. An increase in temperature indicates that a reaction is taking place. If no reaction is observed on the addition of 10% of the sodium bisulfite solution, initiate it by cautiously adding more acid. If manganese, chromium, or molybdenum is present, adjust the pH of the solution to 7 and treat with sulfide to precipitate for burial as hazardous waste. Destroy excess sulfide, neutralize and flush solution down the drain.
- K Please contact the Technical Services Department. Be sure to mention name, catalog number and quantity of the material.
- L The material should be dissolved in 1) water; 2) acid solution or 3) oxidized to a water-soluble state. Precipitate the material as the sulfide, adjusting the pH of the solution to 7 to complete precipitation. Filter the insolubles and dispose of them in a hazardous-waste site. Destroy any excess sulfide with sodium hypochlorite. Neutralize the solution before flushing down the drain.
- M A slurry of the arenediazonium salt with water can be disposed of by adding it gradually to a stirred solution of 5-10% excess 2-naphthol in 3% aqueous sodium hydroxide at 0-20°C. After 12 hours, the resulting azo dye is filtered and either incinerated or buried in a landfill site approved for hazardous-waste disposal. Neutralize the remaining solution before disposal.
- N For small quantities: cautiously add to a large stirred excess of water. Adjust the pH to neutral, separate any insoluble solids or liquids and package them for hazardous-waste disposal. Flush the aqueous solu-

tion down the drain with plenty of water. The hydrolysis and neutralization reactions may generate heat and fumes which can be controlled by the rate of addition.

- O Bury in a landfill site approved for the disposal of chemical and hazardous waste.
- P Material in the elemental state should be recovered for reuse or recycling.
- Q Cautiously make a 5% solution of the material in water or dilute acid. There may be a vigorous, exothermic reaction and fumes may be generated due to the hydrolysis of the material. Control any reaction by cooling and by the rate of addition of the material. Gradually add dilute ammonium hydroxide to pH 10. Filter off any precipitate for disposal in a chemical landfill. If there is no precipitation, gradually adjust the pH from 10 to 6, stopping when precipitation occurs.
- R Catalysts and expensive metals should be recovered for reuse or recycling.
- S Treat a dilute basic solution (pH 10-11) of the material with a 50% excess of commercial laundry bleach. Control the temperature by the addition rate of bleach and adjust pH if necessary. Let stand overnight. Cautiously adjust solution to pH 7. Vigorous evolution of gas may occur. Filter any solids for burial in a chemical landfill. Precipitate any heavy metals by addition of sulfide and isolate for burial. Additional equivalents of hypochlorite may be needed if the metal can be oxidized to a higher valence state. For metal carbonyls, the reaction should be carried out under nitrogen.
- T Cautiously make a 5% solution of the product in water; vent because of possible vigorous evolution of flammable hydrogen gas. Acidify the solution to pH 1 by adding 1M sulfuric acid dropwise. Acidification will cause vigorous evolution of hydrogen gas. Allow the solution to stand overnight. Evaporate the solution to dryness and bury the residue in a landfill site approved for hazardous-waste disposal.
- U Take the material (or a solution) and make a 5% solution in tetrahydrofuran. Cautiously add the solution dropwise to an ice-cooled, stirred basic solution of commercial bleach. Oxidation may release flammable hydrocarbon gases which must be vented. Let stand overnight. Adjust the pH to 7 and destroy excess hypochlorite with sodium bisulfite before disposal of the solution.
- V Under an inert atmosphere cautiously add dry butanol or a mixture of dry butanol in an appropriate solvent, to a solution of the material in tetrahydrofuran. The chemical reaction may be vigorous and/or exothermic. Provisions must be made for the venting of a large volume of flammable hydrogen gas. When gas evolution ceases, cautiously add a basic hypochlorite solution dropwise to the reaction solution. Let stand overnight. Neutralize the solution and treat with sodium bisulfite to destroy any excess hypochlorite. Filter any solids for burial in a landfill site approved for hazardous-waste disposal.

Vehicle Safety Checklist
Ecology & Environment, Inc.
Chicago Office

Date: _____ Time: _____ Odometer: _____
Vehicle Model: _____ Color: _____ License Plate No. _____

INTERIOR:

_____ All Safety Belts-Proper Locking
_____ Parking Brake

START ENGINE:

_____ Oil Pressure
_____ Instrument Panel
_____ (Warning Lights or Buzzers)
_____ Horn
_____ Windshield Wiper & Washer
_____ Heater/Defroster
_____ Mirrors
_____ Steering (Loose)
_____ Interior Lights
_____ Emergency Flashers
_____ Starts Properly

FRONT:

_____ Headlights (Dim/Bright)
_____ Turn Signals
_____ Emergency Flashers

REAR:

_____ Tail Lights
_____ Brake Lights
_____ Back up Lights
_____ Turn Signals
_____ Emergency Flashers

MECHANICAL OPERATION:

_____ Engine (misses, knocks, etc.)
_____ Check Oil
_____ Water/Anti-freeze
_____ Wiper Fluid
_____ Brake Fluid

OUTSIDE:

_____ Tires (properly inflated)
_____ Gas Tank Cap

EMERGENCY EQUIPMENT:

_____ Fire Extinguisher
_____ First Aid Kit
_____ Flags, Flares,
_____ Spare tire (properly inflated)
_____ Tire Changing Kit
_____ (jack, tools, etc.)

REMARKS:

TEAM MEMBER/OPERATOR: _____

(print name)

signature

SITE NAME/ADDRESS: _____

PAN/JOB NUMBER: _____

RETURN OF VEHICLE TO DUTY STATION

Vehicle Cleanliness: _____

Remarks: _____

Corrections Necessary: _____

TEAM MEMBER/OPERATOR: _____

(print name)

signature

Date: _____ Time: _____ Odometer: _____

SITE

MAP

GOES

HERE

JOB NO ZT2051

ecology and environment. inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 4-21-89

CHEMICAL NAME: 2,4, D

CAS NUMBER: 94-75-7 DOT NAME/ID NO.: ORM-D 2765

RQ:

SYNONYMS: 2,4-DICHLOROPHENOXYACETIC ACID

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: 2,4,-C12C6H30CH2C MOLECULAR WEIGHT: 221.0 PHYSICAL STATE: COLORLESS SOLID SPG/D 1.563 SOLUBILITY (H2O): INSOLUBLE
VAPOR PRESS: N/A FREEZING POINT: 286 F BOILING POINT: DECOMPOSES FLASH POINT: N/A FLAMMABLE LIMITS: N/A

ODOR CHARACTERISTICS:

INCOMPATIBILITIES: STRONG OXIDIZERS

BIOLOGICAL PROPERTIES:

IDLH: 500 MG/M3 TLV-TWA: 10 MG/M3 PEL: 10 MG/M3 ODOR THRESHOLD: N/A
HUMAN (LCLO): LD50,80 MG/KG RAT/MOUSE (LC50): AQUATIC:
CARCINOGEN: N/A TERATOGEN: MUTIGEN:
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

RESPIRATORY PROTECTION; APR W/DUST AND ORGANIC VAPOR CARTRIDGES, UP TO 100 MG/M3, SCBA ABOVE 100 MG/M3. PROTECTIVE CLOTHING, PREVENT PROLONGED
REPEATED EXPOSURES RUBBER GLOVES, EYE PROTECTION

MONITORING RECOMMENDATIONS:

AIR MONITORING FOR PARTICULATES

HEALTH HAZARDS: SUSPECTED HUMAN CARCINOGEN. POISON BY INGESTION, INTRAVENOUS AND INTRAPERITONEAL ROUTES. MODERATELY TOXIC BY SKIN CONTACT.
ACUTE SYMPTOMS: INGESTION MAY CAUSE SOMNOLENCE, CONVULSIONS, COMA AND NAUSEA OR VOMITING. CAN CAUSE LIVER AND KIDNEY INJURY. SKIN AND SEVERE EYE
CNS DISTURBANCES; WEAKNESS, MUSCLE TWITCHING, CONVULSIONS, DERMATITIS, EYE/SKIN IRRITATION

CHRONIC SYMPTOMS: CNS DISTURBANCES, DERMATITIS

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER
INGESTION: GIVE LARGE AMOUNTS OF WATER; INDUCE VOMITING; SEEK MEDICAL ATTENTION

DISPOSAL/WASTE TREATMENT:

HIGH TEMP INCINERATION PREFERRED

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [] HAZARDLINE [X] ACGIH [X] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER:

JOB NO ZT2051

ecology and environment, inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-5-89

CHEMICAL NAME: 2,4,5-T

CAS NUMBER: 93-76-5 DOT NAME/ID NO.:

RQ:

SYNONYMS: DACMINE, ESTERONE

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: C₈H₅CL₃O₃

MOLECULAR WEIGHT: 255.49 PHYSICAL STATE: SOLID

SPG/D

SOLUBILITY (H₂O): SOLUBLE

VAPOR PRESS: 0.0 MM FREEZING POINT: 316 F

BOILING POINT: DECOMPOSES FLASH POINT:

FLAMMABLE LIMITS:

ODOR CHARACTERISTICS: ODORLESS

INCOMPATIBILITIES: NONE

BIOLOGICAL PROPERTIES:

IDLH:

TLV-TWA: 10 MG/M³

PEL:

ODOR THRESHOLD: 2.92 MG/KG

HUMAN (LCLO):

RAT/MOUSE (LC50):

AQUATIC:

CARCINOGEN:

TERATOGEN:

MUTIGEN:

ROUTE OF EXPOSURE: ☒ INHALATION ☒ EYE CONTACT ☒ SKIN CONTACT ☒ INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

RESPIRATORS ARE THE ONLY PROTECTIVE DEVICES SPECIFIED BY NIOSH, PROTECTIVE CLOTHING/GLOVES RECOMMENDED, USE PARTICULATE MONITORING EQUIPMENT

MONITORING RECOMMENDATIONS:

OVA - ACGIH TWA VALUE IS 10 MG/M³, THE STEL VALUE IS 20 MG/M³, THE IDLH IS 5,000 MG/M³

HEALTH HAZARDS:

ACUTE SYMPTOMS: ATOMIA, SKIN IRRITATION, ACNE-LIKE RASH, BLOOD IN STOOLS

CHRONIC SYMPTOMS: SAME AS FOR ACATE, ALSO CONSIDERED TO BE CARCINOGEN TERATOGEN AND FETOTOXIC BY EPA

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION

EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER

INGESTION: GIVE LARGE QUANTITIES OF WATER; INDUCE VOMITING; SEEK MEDICAL ATTENTION

DISPOSAL/WASTE TREATMENT:

TWO DISPOSAL PROCEDURES WERE FOUND, MIX WITH EXCESS SODIUM CARBONATE ADD WATER AND LET STAND FOR 24 HOURS BEFORE FLUSHING DOWN THE DRAIN WITH EXCESS WATER AND POUR ON TO VERMICULITE AND WITH WOOD, PAPER AND WASTE ALCOHOL

REFERENCES CONSULTED: ☒ VERSCHUERAN ☒ MERCK INDEX ☐ HAZARDLINE ☐ ACGIH ☒ TOXIC & HAZARDOUS SAFETY MANUAL ☒ CHRIS ☐ SAX
☒ NIOSH/OSHA POCKET GUIDE
☐ OTHER: FARM CHEMICAL HANDBOOK

JOB NO ZT2051

ecology and environment. inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-13-93

CHEMICAL NAME: SILVEX

CAS NUMBER: 93-72-1 DOT NAME/ID NO.:
SYNONYMS: 2-(2,4,5-TRICHLOROPHENOXY)PROPIONIC ACID

RQ:

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: C₉H₇Cl₃O₃ MOLECULAR WEIGHT: 269.53 PHYSICAL STATE: SOLID SPG/D NA SOLUBILITY (H₂O): 0.014%
VAPOR PRESS: NA FREEZING POINT: 180.4C BOILING POINT: NA FLASH POINT: NA FLAMMABLE LIMITS:
ODOR CHARACTERISTICS: NONE GIVEN
INCOMPATIBILITIES: COMBUSTIBLE

BIOLOGICAL PROPERTIES:

IDLH: TLV-TWA: NONE SET PEL: NONE SET ODOR THRESHOLD:
HUMAN (LCLO): RAT/MOUSE (LC50): 650 MG/K AQUATIC:
CARCINOGEN: YES TERATOGEN: YES MUTIGEN: YES
ROUTE OF EXPOSURE: ☒ INHALATION ☒ EYE CONTACT ☒ SKIN CONTACT ☐ INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

NORMALLY CONTAMINATED WITH DIOXIN-TCDD, USE LEVEL B PPE

MONITORING RECOMMENDATIONS:

LOW VAPOR PRESSURE LIMITS VALUE OF OVA OR HNU MONITORING
AVOID CONTACT WITH CONTAMINATED SURFACES

HEALTH HAZARDS:

ACUTE SYMPTOMS:

CHRONIC SYMPTOMS:

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION

EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER

INGESTION:

DISPOSAL/WASTE TREATMENT:

DISPOSE OF AS TSCA HAZARDOUS WASTE

REFERENCES CONSULTED: ☐ VERSCHUERAN ☐ MERCK INDEX ☒ HAZARDLINE ☒ ACGIH ☒ TOXIC & HAZARDOUS SAFETY MANUAL ☐ CHRIS ☐ SAX
☒ NIOSH/OSHA POCKET GUIDE
☐ OTHER: CONDENSED CHEMICAL DICTIONARY

JOB NO 2T2051

ecology and environment. inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5/8/90

CHEMICAL NAME: ARSENIC

CAS NUMBER: 7440-38-2 DOT NAME/ID NO.: ARSENIC, UN 1558

RQ:

SYNONYMS:

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: As MOLECULAR WEIGHT: 74.9 PHYSICAL STATE: BLACK SOLID SPG/D N/A SOLUBILITY (H2O): INSOL
VAPOR PRESS: FREEZING POINT: N/A BOILING POINT: SUBLIM FLASH POINT: FLAMMABLE LIMITS: N/A
ODOR CHARACTERISTICS: ODORLESS
INCOMPATIBILITIES: HALOGENS, OXIDIZERS, ZINC, BROMINE, AZIDE, AIR

BIOLOGICAL PROPERTIES:

IDLH: 100 MG/M3 TLV-TWA: 0.2 MG/M3 PEL: 10 UG/M3 ODOR THRESHOLD:
HUMAN (LCLO): ORAL RAT/MOUSE (LC50): AQUATIC:
CARCINOGEN: YES TERATOGEN: MUTIGEN:
ROUTE OF EXPOSURE: ☒ INHALATION ☒ EYE CONTACT ☐ SKIN CONTACT ☒ INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

<100 UG/M3 USE APR; >UG/M3 USE SCBA; VITON, VINYL, NITRILE, NEOPRENE.

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS: SYSTEMIC POISON REQUIRING SPECIFIC ANTIDOTE

ACUTE SYMPTOMS: ING-STOMACH DISTURBANCES, BURNING/DRY ORAL CAVITIES, VOMITING, SEVERE WEAKNESS, PERFORATION OF NASAL SEPTUM, IRRITATION OF RESPIRATORY TRACT, POSSIBLE SKIN IRRITATION

CHRONIC SYMPTOMS: IHL-INDUSTRIAL CHRONIC POISONING, FATIGUE, WEAKNESS, LOSS OF APPETITE, NAUSEAU, DIARRHEA, HORSENESS, UPPER RESP MUCOSA IRRITATION, ADVANCED STAGES SEE NERVE PROBLEMS IN EXTREMITIES, LIVER DAMAGE, LUNG CANCER, SKIN CANCER.

FIRST AID

INHALATION: REMOVE TO FRESH AIR; GIVE ARTIFICIAL RESPIRATION IF NEEDED
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER
INGESTION: GET MEDICAL ATTENTION IMMEDIATELY

DISPOSAL/WASTE TREATMENT:

REFERENCES CONSULTED: ☐ VERSCHUERAN ☐ MERCK INDEX ☐ HAZARDLINE ☒ ACGIH ☐ TOXIC & HAZARDOUS SAFETY MANUAL ☐ CHRIS ☐ SAX
☒ NIOSH/OSHA POCKET GUIDE
☐ OTHER: SAX, ALDRICH

JOB NO ZT2051

ecology and environment. inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 4-12-89

CHEMICAL NAME: BARIUM

CAS NUMBER: DOT NAME/ID NO.: 1400
SYNONYMS: METALLIC BARIUM, BARIUM METAL

RQ:

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: BA MOLECULAR WEIGHT: 137.36 PHYSICAL STATE: SOLID SPG/D 3.5 SOLUBILITY (H2O): REACTS
VAPOR PRESS: 10MM FREEZING POINT: 1337 F BOILING POINT: FLASH POINT: FLAM SOLID FLAMMABLE LIMITS:
ODOR CHARACTERISTICS:
INCOMPATIBILITIES: REACTS WITH WATER RELEASING TOXIC GASES. AMMONIA, OZ, HALOGENS, ACIDS METAL IN POWDERED FORM IS EXPLOSIVE

BIOLOGICAL PROPERTIES:

IDLH: 250 MG/M3 TLV-TWA: 0.5 MG/M3 PEL: 0.5 MG/M3 ODOR THRESHOLD:
HUMAN (LCLO): RAT/MOUSE (LC50): AQUATIC:
CARCINOGEN: TERATOGEN: MUTIGEN:
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

PREVENT SKIN CONTACT, WEAR GLOVES, IMPERVIOUS CLOTHING

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS: SOLUBLE BARIUM COMPOUNDS ARE PRIMARY SKIN IRRITANTS AND CONVULSANT POISONS. MAY CAUSE LOCAL IRRITATION OF EYES, NOSE, THROAT, BRONCHIAL TUBES AND SKIN. SOLUBLE BARIUM COMPOUNDS MAY ALSO CAUSE SEVERE STOMACH PAINS, SLOW PULSE RATE, IRREGULAR HEART BEAT,
ACUTE SYMPTOMS: TIGHTNESS OF NECK AND FACIAL MUSCLES, VOMITTING, DIARRHEA, PAIN, WEAKNESS, CARDIAC DISTURBANCES AND CONVULSIONS

CHRONIC SYMPTOMS: NO CHRONIC POISONING HAS BEEN REPORTED

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH IMMEDIATELY WITH SOAP AND WATER
INGESTION: GIVE LARGE QUANTITIES OF WATER; INDUCE VOMITING; SEEK MEDICAL ATTENTION

DISPOSAL/WASTE TREATMENT:

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [] HAZARDLINE [] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [] CHRIS [] SAX
[] NIOSH/OSHA POCKET GUIDE
[] OTHER: OHS DATABASE

JOB NO ZT2051

ecology and environment. inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-8-90

CHEMICAL NAME: BENZENE

CAS NUMBER: 71-43-2

DOT NAME/ID NO.:

RQ:

SYNONYMS: BENZOL, BENZOLE, CYCLOHEXATRIENE, BENZOLENE, BICARBURET OF HYDROGEN, CARBON OIL, COAL NAPHTHA

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: C6H6

MOLECULAR WEIGHT: 78

PHYSICAL STATE: LIQUID

SPG/D 0.879 SOLUBILITY (H2O): SLIGHTLY

VAPOR PRESS: 75MM

FREEZING POINT: 42 F

BOILING POINT: 176 F

FLASH POINT: 12 F

FLAMMABLE LIMITS: 1.3-7.1%

ODOR CHARACTERISTICS: 4.68 PPM

INCOMPATIBILITIES: STRONG OXIDIZERS, CHLORINE, BROMINE

BIOLOGICAL PROPERTIES:

IDLH:

TLV-TWA: 10 PPM

PEL: 1 PPM

ODOR THRESHOLD:

HUMAN (LCLO): TCLO 100/CNS

RAT/MOUSE (LC50): TCLO 50/

AQUATIC:

CARCINOGEN: HUMAN-SUS

TERATOGEN:

MUTIGEN: EXPER

ROUTE OF EXPOSURE: [X] INHALATION

[X] EYE CONTACT

[X] SKIN CONTACT

[X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

10 PPM USE SCBA, USE PROTECTIVE CLOTHING, EXCEL-VITON;GOOD-NEOPRENE, SARANAX; POOR-BUTYL, NATURAL RUBBER FOR GLOVES, AVOID SKIN/EYE CONTACT

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS: CAN CAUSE DIZZINESS, EUPHORIA, GIDDINESS, HEADACHE, NAUSEA, STAGGERING GAIT, WEAKNESS, DROWSINESS, RESPIRATORY IRRITATION, PULMONARY EDEMA AND PNEUMONIA, GASTROINTESTINAL IRRITATION, CONVULSIONS, AND PARALYSIS. CAN ALSO CAUSE IRRITATION TO SKIN, EYES

ACUTE SYMPTOMS: SKIN IRRITANT, CNS DEPRESSANT, MOSTLY IHL, INITIAL EXCITATION FOLLOWED BY HEADACHE, DIZZINESS, VOMITING, DELIRIUM, SEVERE EXPOSURE MAY SEE TREMORS, BLURRED VISION, SHALLOW RESP, CONVULSIONS

CHRONIC SYMPTOMS: ANOREXIA, DROWSINESS, ANEMIA, BLEEDING UNDER SKIN, REDUCED BLOOD CLOTTING;LIVER, KIDNEY, BONE MARROW DAMAGE, LEUKEMIA

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION

EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER

INGESTION: DO NOT INDUCE VOMITING, GIVE WATER OR MILK, GET MEDICAL ATTENTION IMMEDIATELY

DISPOSAL/WASTE TREATMENT:

TOXIC FUMES OF CARBON DIOXIDE, CARBON MONOXIDE

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [X] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [] CHRIS [] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: CHRIS (VOL III), SAX, ALDRICH, RTECS

JOB NO ZT2051

ecology and environment. inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-8-90

CHEMICAL NAME: CADMIUM

CAS NUMBER: 7440-43-9 DOT NAME/ID NO.:
SYNONYMS: C.I 77180

RQ:

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: CD MOLECULAR WEIGHT: 112.4 PHYSICAL STATE: CRYSTALS SPG/D 8.642 SOLUBILITY (H2O): INSOLUBLE
VAPOR PRESS: FREEZING POINT: 609 F BOILING POINT: 1412 F FLASH POINT: N/A FLAMMABLE LIMITS: N/A
ODOR CHARACTERISTICS: NONE
INCOMPATIBILITIES: STRONG OXIDIZERS, SULFUR, SELENIUM, ZINC, AMMONIA

BIOLOGICAL PROPERTIES:

IDLH: 40 MG/M3 TLV-TWA: .05 MG/M3 PEL: .2 MG/M3 ODOR THRESHOLD:
HUMAN (LCLO): TCLO 39MG/M3/20M RAT/MOUSE (LC50): AQUATIC: N/A
CARCINOGEN: ANIMAL-POS TERATOGEN: MUTIGEN: EXP
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

ANY DETECTABLE AIR CONCENTRATION-USE SCBA, USE CHEMICAL RESISTANT GLOVES & BOOTS

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS: CADMIUM DUST MAY CAUSE IRRITATION OF THE NOSE AND THROAT. IF ENOUGH HAS BEEN INHALED AFTER A DELAY OF SEVERAL HOURS, A PERSON MAY ALSO DEVELOP COUGH, CHEST PAIN, SWEATING, CHILLS, SHORTNESS OF BREATH, AND WEAKNESS. DEATH MAY OCCUR. INGESTION OF CADMIUM
ACUTE SYMPTOMS: IRRITATION OF NOSE & THROAT, 2-HOUR DELAY BEFORE SYMPTOMS OF COUGH, CHEST PAIN, NAUSEA, VOMITING, DIZZINESS, CHILLS, STOMACH DISTRESS, NAUSEA, VOMITING, DIARRHEA, ABOMINAL CRAMPS
CHRONIC SYMPTOMS: LOSS OF SMELL, ULCERATION OF NOSE, SHORTNESS OF BREATH, LIVER DAMAGE, KIDNEY DAMAGE (MOST AFFECTED), MILD ANEMIA, EMPHYSEMA, LINKED TO CANCER & HYPERTENSION

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER
INGESTION: GIVE LARGE QUANTITIES OF WATER; INDUCE VOMITING; SEEK MEDICAL ATTENTION

DISPOSAL/WASTE TREATMENT:

TOXIC CD FUMES

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [] CHRIS [] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: SAX, ALDRICH, RTECS, CASARETT & DOULL'S TOXICOLOGY, NIOSH OCCUPATIONAL HEALTHGUIDES

JOB NO ZT2051

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HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 6/07/93

CHEMICAL NAME: Chromium

CAS NUMBER: 744-47-3 DOT NAME/ID NO.:

RQ:

SYNONYMS: Chromium metals and insoluble salts

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: Cr MOLECULAR WEIGHT: 52 PHYSICAL STATE: Solid SPG/D 7.2 SOLUBILITY (H2O): insoluble
VAPOR PRESS: Variable FREEZING POINT: 3339 F BOILING POINT: 4842 F FLASH POINT: variable FLAMMABLE LIMITS: 23% LEL
ODOR CHARACTERISTICS: NA
INCOMPATIBILITIES: Strong Oxidizers,

BIOLOGICAL PROPERTIES:

IDLH: 500 mg/m3 TLV-TWA: NA PEL: 1.0mg/m3 ODOR THRESHOLD:
HUMAN (LCLO): RAT/MOUSE (LC50): AQUATIC:
CARCINOGEN: TERATOGEN: MUTIGEN:
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

Respiratory protection with GMC-H cart. >5mg/m3 use SCBA
Skin protection (gloves and coveralls)

MONITORING RECOMMENDATIONS:

Particulates in air - miniram

HEALTH HAZARDS:

ACUTE SYMPTOMS: contact dermatitis, ulceration of skin and nasal mucosa, irritation of eyes and mucous membrane

CHRONIC SYMPTOMS: Not available

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER
INGESTION: GIVE LARGE QUANTITIES OF WATER; INDUCE VOMITING; SEEK MEDICAL ATTENTION

DISPOSAL/WASTE TREATMENT:

Segregate contaminated material, double bag, dispose of as hazardous material

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: Pattys Industrial Hygiene and Toxicology

JOB NO ZT2051

ecology and environment. inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-9-90

CHEMICAL NAME: CHROMIUM (HEXAVALENT)

CAS NUMBER: 7440-47-3 DOT NAME/ID NO.:

RQ:

SYNONYMS: CHROMIC OXIDE, SOLUBLE CHROMIC SALTS

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: CR (CR03) MOLECULAR WEIGHT: 52 PHYSICAL STATE: VARIABLE SPG/D VAR SOLUBILITY (H2O): INSOLUBLE
VAPOR PRESS: VARIABLE FREEZING POINT: VARIABLE BOILING POINT: VARIABLE FLASH POINT: VARIABLE FLAMMABLE LIMITS: VARIABLE
ODOR CHARACTERISTICS:
INCOMPATIBILITIES: STRONG OXIDIZERS, WATER

BIOLOGICAL PROPERTIES:

IDLH: 250 MG/M3 TLV-TWA: .05 MG/M3 PEL: .5 MG/M3 ODOR THRESHOLD: VARIABLE
HUMAN (LCLO): RAT/MOUSE (LC50): AQUATIC:
CARCINOGEN: POS-ANIMAL TERATOGEN: MUTIGEN: EXP
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

ANY DETECTABLE LIMIT - SCBA, GOOD-VITON, VINYL, POOR; NEOPRENE, PREVENT SKIN/EYE CONTACT

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS: EXPOSURE TO CERTAIN SOLUBLE CHROMIC OR CHROMOUS SALTS HAVE BEEN REPORTED TO CAUSE AN ALLERGIC SKIN RASH. CONFIRMED CARCINOGEN.
PROBABLY A SEVERE EYE, SKIN AND MUCOUS MEMBRANE IRRITANT. A POWERFUL OXIDIZER.
ACUTE SYMPTOMS: CONTACT DERMATITIS, IRRITATION OF MUCOUS MEMBRANES/UPPER RESPIRATORY TRACT, COUGHING, WHEEZING, HEADACHE, FEVER, WEIGHT LOSS,
ULCERATION OF NASAL SEPTUM, NAUSEA, VOMITING
CHRONIC SYMPTOMS: CARCINOGEN, LIVER AND/OR KIDNEY DAMAGE, BRONCHITIS, ULCERATION OF SKIN, LUNG CANCER

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS CHEMICAL
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER
INGESTION: GIVE LARGE QUANTITIES OF WATER; INDUCE VOMITING; SEEK MEDICAL ATTENTION

DISPOSAL/WASTE TREATMENT:

TOXIC FUMES

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [X] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [] CHRIS [X] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: ALDRICH, SITTING

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HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-29-90

CHEMICAL NAME: DIOXIN

CAS NUMBER: 1745-01-6 DOT NAME/ID NO.:
SYNONYMS: TCDO, CONTAMINANT OF TETRACHLORODIOXIN

RQ:

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: C₁₂H₄Cl₄O₂ MOLECULAR WEIGHT: 322 PHYSICAL STATE: SOLID SPG/D SOLUBILITY (H₂O): INSOLUBLE
VAPOR PRESS: FREEZING POINT: 305.009 BOILING POINT: FLASH POINT: FLAMMABLE LIMITS:
ODOR CHARACTERISTICS:
INCOMPATIBILITIES: ULTRAVIOLET LIGHT

BIOLOGICAL PROPERTIES:

IDLH: TLV-TWA: PEL: ODOR THRESHOLD:
HUMAN (LCLO): RAT/MOUSE (LC50): AQUATIC:
CARCINOGEN: HUMAN SUS TERATOGEN: MUTIGEN: ANIMAL POS
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

APR DUSTY/WINDY CONDIT OR KNOWN HIGH CONCENT OR 1 BUT 5PPM

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS:

ACUTE SYMPTOMS: CHLORACNE, LIVER TOXICITY OR CIRRHOSIS, DIARRHEA, HEADACHE, WEIGHT LOSS, PSYCHOLOG DISTURB, INFLAMM OF KIDNEY/BLADDER, THYMUS ATROPHY

CHRONIC SYMPTOMS: CAUSES CANCER IN LAB ANIMALS LIVER/LUNG TUMORS, SUPPRESSES INNUMITIES

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION

EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER

INGESTION:

DISPOSAL/WASTE TREATMENT:

REFERENCES CONSULTED: [] VERSCHUERAN [X] MERCK INDEX [] HAZARDLINE [] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [] CHRIS [] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: RTECS, COND CHEM DICT, CASARETT & DOULLS

JOB NO ZT2051

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HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-22-90

CHEMICAL NAME: DIOXIN (TCDD)

CAS NUMBER: 1746-01-6 DOT NAME/ID NO.:
SYNONYMS: 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN

RQ:

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: C12H4CL4O2 MOLECULAR WEIGHT: 322 PHYSICAL STATE: SOLID SPG/D SOLUBILITY (H2O): SOLUBLE
VAPOR PRESS: N/A FREEZING POINT: 305 F BOILING POINT: DECOMP FLASH POINT: N/A FLAMMABLE LIMITS: N/A
ODOR CHARACTERISTICS:
INCOMPATIBILITIES: UNKNOWN; DECOMPOSES WHEN EXPOSED TO ULTRAVIOLET LIGHT

BIOLOGICAL PROPERTIES:

IDLH: TLV-TWA: PEL: ODOR THRESHOLD: NONE
HUMAN (LCLO): RAT/MOUSE (LC50): AQUATIC:
CARCINOGEN: SUS-HUMAN TERATOGEN: MUTIGEN: POS-ANIMAL
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

LOW CONCENTRATIONS-APR; UNKNOWN OR HIGH CONCENTRATIONS-SCBA, IMPERVIOUS CLOTHING, GLOVES, SAFETY GOGGLES, CONTACT SHOULD BE COMPLETELY AVOIDED.

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS:

ACUTE SYMPTOMS: CHLORACNE, LIVER TOXICITY OR CIRRHOSIS, SYMPTOMS OF DIARRHEA, HEADACHE, WEIGHT LOSS, PSYCHOLOGICAL DISTURBANCES, INFLAMMATION OF KIDNEY & BLADDER, THYMUS ATROPHY

CHRONIC SYMPTOMS: HAS BEEN DETERMINE TO CAUSE CANCER IN LAB ANIMALS (LIVER AND/OR LUNG TUMORS), SUPPRESSES IMMUNITIES

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE AMYL NITRITE PEARLS; GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER
INGESTION: INDUCE VOMITING

DISPOSAL/WASTE TREATMENT:

CONTROLLED INCINERATION

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [X] HAZARDLINE [] ACGIH [X] TOXIC & HAZARDOUS SAFETY MANUAL [] CHRIS [X] SAX
[] NIOSH/OSHA POCKET GUIDE
[] OTHER: CASARETT & DOULL'S TOXICOLOGY, ANNUAL REPORT ON CARCINOGENS, 1983

JOB NO ZT2051

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HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-22-90

CHEMICAL NAME: ETHYL BENZENE

CAS NUMBER: 100-41-4 DOT NAME/ID NO.:

RQ:

SYNONYMS: PHENYLETHANE, ETHYL BENZOL

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: C₂H₅C₆H₅

MOLECULAR WEIGHT: 106

PHYSICAL STATE: LIQUID

SPG/D 0.867 SOLUBILITY (H₂O): SLIGHTLY

VAPOR PRESS: 7.1 MM

FREEZING POINT: -139 F

BOILING POINT: 277 F

FLASH POINT: 59 F

FLAMMABLE LIMITS: 1.0-6.7%

ODOR CHARACTERISTICS:

INCOMPATIBILITIES: OXIDIZERS, OZONE, OXYGEN

BIOLOGICAL PROPERTIES:

IDLH:

TLV-TWA: 100 PPM

PEL: 100 PPM

ODOR THRESHOLD: 140 PPM

HUMAN (LCLO): 100 PPM

RAT/MOUSE (LC50): 400 PPM

AQUATIC: 100-10 PPM

CARCINOGEN: NEG

TERATOGEN:

MUTIGEN: NEG

ROUTE OF EXPOSURE: ☒ INHALATION ☒ EYE CONTACT ☒ SKIN CONTACT ☒ INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

100 PPM APR W/CHEMICAL CARTRIDGE, 2000 PPM-SCBA, EXCEL-VITON; POOR-BUTYL, NATURAL; VAR-NEOPRENE, NITRILE

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS: DO NOT INDUCE VOMITING MEDICAL ATTENT TO REMOVE BY GASTRIC LAVAGE, MOVE TO FRESH AIR, CPR IF NECESSARY, MEDICAL ATTENT, IRRIGATE IMMED W/WATER, WASH SKIN THROUGHLY W/SOAP & WATER

ACUTE SYMPTOMS: IRRITATION OF SKIN,EYES, NOSE, MUCOUS MEMBRANES, DIZZINESS, CONSTRICTION OF CHEST, LACRIMATION, NAUSEA, HEADACHE, VOMITING, CNS DEPRESSION

CHRONIC SYMPTOMS: SKIN CONTACT MAY CAUSE ERYTHEMA & SKIN INFLAMMATION, NO OTHER DATA FOR CHRONIC EFFECTS

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE AMYL NITRITE PEARLS; GIVE ARTIFICAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION

EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER

INGESTION: DO NOT INDUCE VOMITING

DISPOSAL/WASTE TREATMENT:

REFERENCES CONSULTED: ☐ VERSCHUERAN ☐ MERCK INDEX ☐ HAZARDLINE ☒ ACGIH ☐ TOXIC & HAZARDOUS SAFETY MANUAL ☒ CHRIS ☒ SAX
☒ NIOSH/OSHA POCKET GUIDE
☐ OTHER: ALDRICH

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HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 6-09-93

CHEMICAL NAME: LEAD

CAS NUMBER: 7439-92-1 DOT NAME/ID NO.:

RQ:

SYNONYMS: WHITE LEAD, PLUMBUM

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: PB MOLECULAR WEIGHT: 207 PHYSICAL STATE: VARIABLE SPG/D 11.3 SOLUBILITY (H2O): INSOLUBLE
VAPOR PRESS: VARIABLE FREEZING POINT: BOILING POINT: 3164 F FLASH POINT: INCOMBUST FLAMMABLE LIMITS: INCOMBUS
ODOR CHARACTERISTICS:
INCOMPATIBILITIES: STRONG OXIDIZERS, PEROXIDES, ACTIVE METALS

BIOLOGICAL PROPERTIES:

IDLH: VARIABLE TLV-TWA: .15 mg/M3 PEL: .05mg/m3 ODOR THRESHOLD: NONE
HUMAN (LCLO): RAT/MOUSE (LC50): AQUATIC: UNKNOWN
CARCINOGEN: INDEF TERATOGEN: EXP MUTIGEN: INDEF
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

5 MG/M3 HIGH EFFICIENCY PARTICULATE RESPIRATOR, OTHER CONCENTRATIONS - SCBA, AVOID SKIN AND EYE CONTACT

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS: SUSPECTED CARCINOGEN. POISON BY INGESTION. MAY CAUSE LOSS OF APPETITE, ANEMIA, MALAISE. INSOMNIA, HEADACHE, IRRITABILITY, MUSCLE AND JOINT PAINS, TREMORS, FLACCID PARALYSIS, HALLUCINATIONS AND DISTORTED PERCEPTIONS, MUSCLE WEAKNESS, GASTRITIS AND LIVER
ACUTE SYMPTOMS: CUMULATIVE NEUROTOXIN-COMMONLY OCCURS FROM PROLONGED EXPOSURE, SYMPTOMS INCLUDE STOMACH DISTRESS, VOMITING, DIARRHEA, BLACK STOOLS, ANEMIA, NERVOUS SYSTEM EFFECTS
CHRONIC SYMPTOMS: 3 CLINICAL TYPES A-AILMENTARY-ABOMINAL PAIN, DISCOMFORT, CONSTIPATION OR DIARRHEA, METALLIC TASTE, LEAD LINE ON GUM, HEADACHE, B-NUEROMUSCULAR, MUSCLE WEAKNESS, JOINT/MUSCLE PAIN, DIZZINESS, INSOMIA, PARALYSIS C-ENCEPHALIC BRAIN INVOLVEMENT, STUPOR, COMA, DEATH, RARE REPRODUCTIVE EFFECTS, HUMAN EPID STUDIES HAVE CONCLUDED THAT LEAD IS A POSION TO MALE & FEMALE GERM CELLS;INCREASED

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER
INGESTION: GIVE LARGE QUANTITIES OF WATER; INDUCE VOMITING; SEEK MEDICAL ATTENTION IMMEDIATELY

DISPOSAL/WASTE TREATMENT:

TOXIC FUMES OF LEAD

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [X] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [X] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: ALDRICH, RTECS, SITTING

JOB NO ZT2051

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HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-23-90

CHEMICAL NAME: NICKEL

CAS NUMBER: 7440-02-0 DOT NAME/ID NO.:

RQ:

SYNONYMS: RANEY ALLOY, NICKEL PARTICLES

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: NI MOLECULAR WEIGHT: 58.7 PHYSICAL STATE: POWDER SPG/D N/A SOLUBILITY (H2O): INSOLUBLE
VAPOR PRESS: N/A FREEZING POINT: 2651 F BOILING POINT: 4946 F FLASH POINT: N/A FLAMMABLE LIMITS: N/A
ODOR CHARACTERISTICS:
INCOMPATIBILITIES: STRONG ACIDS, SULFUR, WOOD, POTASSIUM PERCHLORATE, POWDER FORM IS EXPLOSIVE

BIOLOGICAL PROPERTIES:

IDLH: TLV-TWA: 1 MG/M3 PEL: 1 MG/M3 ODOR THRESHOLD: NONE
HUMAN (LCLO): RAT/MOUSE (LC50): AQUATIC:
CARCINOGEN: HUMAN-SUS TERATOGEN: MUTIGEN: EXPER
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

ANY DETECTABLE LIMIT USE SCBA, PREVENT SKIN EXPOSURE OR PORLONGED CONTACT

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS:

ACUTE SYMPTOMS: IRRITATION OF SKIN, EYES, MUCOUS MEMBRANES OF UPPER RESPIRATORY TRACT, NAUSEA, VOMITING, GIDDINESS, HEADACHE

CHRONIC SYMPTOMS: DERMATITIS RESULTING FROM SKIN SENSITIZATION, CANCER OF THE LUNG & NASAL PASSAGES IN NICKEL REFINING EMPLOYEES

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER
INGESTION: DO NO INDUCE VOMITING; SEEK MEDICAL ATTENTION TO REMOVE BY GASTRIC LAVAGE

DISPOSAL/WASTE TREATMENT:

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [X] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [] CHRIS [X] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: ALDRICH

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HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 6-09-93

CHEMICAL NAME: TOLUENE

CAS NUMBER: 108-88-3 DOT NAME/ID NO.:

RQ:

SYNONYMS: PHENYL METHANE, METHYL BENZENE

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: C₆H₅CH₃

MOLECULAR WEIGHT: 92

PHYSICAL STATE: LIQUID

SPG/D 0.867 SOLUBILITY (H₂O): SLIGHTLY

VAPOR PRESS: 22 MM

FREEZING POINT: -139 F

BOILING POINT: 231 F

FLASH POINT: 40 F

FLAMMABLE LIMITS: 1.27-7%

ODOR CHARACTERISTICS:

INCOMPATIBILITIES: STRONG OXIDIZERS, NITRIC ACID, PEROXIDES

BIOLOGICAL PROPERTIES:

IDLH: 2000 PPM

TLV-TWA: 50 PPM

PEL: 100 PPM

ODOR THRESHOLD: 0.17 PPM

HUMAN (LCLO): TCLO 200 PPM

RAT/MOUSE (LC50): LCLO 400

AQUATIC: TLM 96: 100-10 PPM

CARCINOGEN: EXPER

TERATOGEN: EXP

MUTIGEN: EXPER

ROUTE OF EXPOSURE: [X] INHALATION

[X] EYE CONTACT

[X] SKIN CONTACT

[X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

1000 PPM-APR W/CHEMICAL CARTRIDGE; 2000 PPM-SCBA, EXCEL-VITON, GOOD-POLYURETHANE, NEOPRENE/STYRENE; POOR-NEOPRENE, BUTYL

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS: MAY CAUSE IRRITATION OF EYES, RESPIRATORY TRACT AND SKIN. MAY ALSO CAUSE FATIGUE, WEAKNESS, CONFUSION, HEADACHE, DIZZINESS AND DROWSINESS. EXPOSURE TO HIGH CONCENTRATIONS CAN CAUSE UNCONSCIOUSNESS AND DEATH. INHALATION MAY CAUSE DIFFICULTY SEEING IN

ACUTE SYMPTOMS: DIZZINESS, HEADACHE, VOMITING, NAUSEA, DIARRHEA, LIQUID IRRITATES EYES, DRIES SKIN

CHRONIC SYMPTOMS: KIDNEY AND/OR LIVER DAMAGE IF INGESTED, INHALATION MAY CAUSE ANEMIA, BONE MARROW HYPOPLASIA, DERMATITIS WITH SKIN CONTACT

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION

EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS CHEMICAL

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER

INGESTION: DO NOT INDUCE VOMITING; SEEK MEDICAL ATTENTION IMMEDIATELY

DISPOSAL/WASTE TREATMENT:

CO, CO₂

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [X] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [X] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: ALDRICH, SITTIG

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HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 5-29-90

CHEMICAL NAME: XYLENE, ALL ISOMERS

CAS NUMBER: 1830-20-7 DOT NAME/ID NO.: FLAMMABLE
SYNONYMS: DIMETHYLBENZENE, XYLOL

RQ:

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: C₆H₄(CH₃)₂ MOLECULAR WEIGHT: 106.20 PHYSICAL STATE: LIQUID SPG/D 086 SOLUBILITY (H₂O): INSOLUBLE
VAPOR PRESS: 9 MM FREEZING POINT: BOILING POINT: FLASH POINT: 31 F FLAMMABLE LIMITS:
ODOR CHARACTERISTICS: AROMATIC ODOR, SWEET
INCOMPATIBILITIES: STRONG OXIDIZERS

BIOLOGICAL PROPERTIES:

IDLH: 1000 PPM TLV-TWA: 100 PPM PEL: 100 PPM ODOR THRESHOLD: 20 PPM
HUMAN (LCLO): RAT/MOUSE (LC50): AQUATIC:
CARCINOGEN: TERATOGEN: MUTIGEN: EXPER
ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

APR DUSTY/WINDY CONDIT OR KNOWN HIGH CONCENT OR 1 BUT 5PPM SCBA, COVERALL PE TYVEK, GLOVES PVA, VITON PVA DEGRADES IN WATER

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS:

ACUTE SYMPTOMS: VAPOR CAUSE DIZZINESS, HEADACHE, COUGH, PULMONARY DISTRESS/EDEMA, NAUSEA/VOMITING, ABDOMINAL CRAMPS, NARCOTIC IN HIGH CONCENT, MILD SKIN IRRITANT

CHRONIC SYMPTOMS: POSSIBLE LIVER AND/OR KIDNEY DAMAGE, PULMONARY CONGESTION, INGESTION MAY BE FATAL

FIRST AID

INHALATION: REMOVE TO FRESH AIR, GIVE ARTIFICIAL RESPIRATION IF NEEDED, SEEK MEDICAL ATTENTION
EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES
SKIN CONTACT: REMOVE CONTAMINATED CLOTHING; WASH WITH SOAP AND WATER
INGESTION: DO NOT INDUCE VOMITING; SEEK MEDICAL ATTENTION

DISPOSAL/WASTE TREATMENT:

REFERENCES CONSULTED: [] VERSCHUERAN [X] MERCK INDEX [] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: RTECS, NIOSH GUIDES, SIGMA-ALDRICH

JOB NO ZT2051

ecology and environment. inc.
HAZARD EVALUATION OF CHEMICALS

PREPARATION/UPDATE DATE 6-09-93

CHEMICAL NAME: ZINC

CAS NUMBER:

DOT NAME/ID NO.:

RQ:

SYNONYMS: BLUE POWDER, CI 77945 JASAD

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA: ZN

MOLECULAR WEIGHT: 6537

PHYSICAL STATE: SOLID

SPG/D 714

SOLUBILITY (H2O): INSOLUBLE

VAPOR PRESS:

FREEZING POINT: 787 F

BOILING POINT: 1655 F

FLASH POINT: NON FLAM

FLAMMABLE LIMITS:

ODOR CHARACTERISTICS:

INCOMPATIBILITIES: ACIDS, SODIUM PEROXIDE, CHLORINE, WATER SULFER

BIOLOGICAL PROPERTIES:

IDLH:

TLV-TWA: 10mg/m3

PEL: 10mg/m3

ODOR THRESHOLD:

HUMAN (LCLO):

RAT/MOUSE (LC50):

AQUATIC:

CARCINOGEN:

TERATOGEN:

MUTIGEN:

ROUTE OF EXPOSURE: [X] INHALATION [X] EYE CONTACT [X] SKIN CONTACT [X] INGESTION

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

PREVENT PROLONGED SKIN CONTACT WEAR IMPERVIOUS CLOTHING, GLOVES AND FACESHIELD

MONITORING RECOMMENDATIONS:

HEALTH HAZARDS:

ACUTE SYMPTOMS: SKIN IRRITATION, COUGHING WEAKNESS, MUSCULAR ACHE, FEVER, NAUSEA VOMITING

CHRONIC SYMPTOMS: NONE SPECIFIED

FIRST AID

INHALATION:

EYE CONTACT: FLUSH/RINSE WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES; SEEK MEDICAL ATTENTION

SKIN CONTACT:

INGESTION:

DISPOSAL/WASTE TREATMENT:

PLACE CONTAMINATED CLOTHING IN CLOSED CONTAINERS FOR STORAGE UNTIL LAUNDERED OR DISCARD

REFERENCES CONSULTED: [] VERSCHUERAN [] MERCK INDEX [] HAZARDLINE [X] ACGIH [] TOXIC & HAZARDOUS SAFETY MANUAL [X] CHRIS [] SAX
[X] NIOSH/OSHA POCKET GUIDE
[] OTHER: OHS, Pattys Industrial Hygiene and Toxicology

Ecology and Environment, Inc.
Hazard Evaluation of Chemicals
Region V - Chicago

DATE : / /
JOB NO: _____

CHEMICAL NAME

SYN :
CAS NO: _____ FORMULA:
DOT CLASS:

CHEMICAL PROPERTIES

Phys St:	Boil Pt:	Ioniz Pot:	FI Pt:
Mol Wt:	Melt Pt:	Vap Press:	LFL:
Sp Gr:	Frz Pt:	Odor Thr:	UFL:
Odor:			
INCOMPAT/REACT:			
SOLUBILITY:			

TOXICOLOGICAL PROPERTIES

Exposure Limits: TLV-TWA (ACGIH):	PEL (OSHA):	STEL:	IDLH:
Tox Data: INHAL:			
DERMAL:			
ORAL:			
CARCIN:			
MUTAGEN:			
REPRO TOX:			
AQUATIC:			
OTHER TOX:			
ROUTES OF EXP:			

PERSONAL PROTECTIVE MEASURES

RESPIRATORS:
CARTRIDGE TYPE:
PROTECTIVE CLOTHING:
SPEC PRECAUTIONS:

FIRST AID

INHALATION:
EYE/SKIN:
INGESTION:

SYMPTOMS

ACUTE:

CHRONIC:

DISPOSAL, FIRE, SPILLS (see attached sheet)

DISPOSAL:
DECOMPOSITION PRODUCTS:

FIRE:

LEAKS & SPILLS:

REFERENCES CONSULTED

CHEMICAL CLASSIFICATION:

LAST REVISION DATE:
/ /